

2/2 018

UNCLASSIFIED

PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0139613

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HELA CELLS WERE INCUBATED WITH THYMIDINE PRIME3 H FOR 20 HR AND THEN IRRADIATED WITH UV (MAX. 253.7 NM). THE INCUBATION CONTINUED AND SAMPLES WERE TAKEN FOR THYMIDINE-THYMIDINE DIMER RATIO DETN. BY PAPER CHROMATOG. WITH A N-BUTANOL DOUBLE BOND ACID DOUBLE BOND WATER (80:12:30) SOLVENT SYSTEM. THE AMT. OF THYMIDINE DIMERS INCREASED LINEARLY WITH THE RADIATION DOSE UNTIL A PLATEAU WAS REACHED. A DECREASE IN DIMERS WAS OBSD. IN THE DARK INCUBATION AFTER IRRADN. FACILITY: INST. OBSSHCH. GENET., MOSCOW, USSR.

UNCLASSIFIED

Waveguides

USSR

UDC 621.373.826:621.372.8:535

GOROSHKO, A. I. and KULESHOV, Ye. M.

"Investigating a Hollow Dielectric Waveguide for Millimeter and Submillimeter Wavelengths"

Radiotekhnika. Resp. mezhved. temat. nauch.-tekhn. sb. (Electronics Engineering, Republic Interdepartmental Thematic Scientific-Technical Collection) No 21, 1972, pp 215-219 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10D424)

Translation: The attenuation of a hybrid  $HN_{11}$  wave is experimentally measured in a hollow dielectric waveguide with an internal diameter of 20 mm, in the 0.8-1.6 mm range. The results of the experiment are compared with the theory for waveguides of relatively large transverse dimensions. Two illustrations, bibliography of four. Resume

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USSR

UDC: 621.372.852.2(088.8)

SHCHERBOV, V. A., GOROSHKO, A. I.

"A Superhigh-Frequency Phase Shifter"

USSR Author's Certificate No 264493, filed 8 May 68, Published 16 Jun 70  
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12B246 P)

Translation: The proposed phase shifter contains a section of dielectric circular waveguide, a rotating dielectric disc located inside the waveguide, and a mechanical drive for the rotating disc. In order to extend the dynamic range of phase variation, the generatrix of the disc, which is fitted with a lug, forms one turn of an Archimedes spiral; the axis of rotation of the disc passes through the pole of the spiral. Two illustrations. Resumé.

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USSR

UDC: 517.9:539.3

GOROSHKO, O. A., NOVIKOV, V. D.

"On Dynamic Forces in an Elastic Filament Entrained by a Free Body"

Mat. fizika. Resp. mezhved. sb. (Mathematical Physics. Republic Interdepartmental Collection), 1970, vyp. 8, pp 64-67 (from REh-Matematika, No 5, May 71, Abstract No 5B505)

Translation: This study of the motion of an elastic filament entrained by a projectile is based on Fredholm's integral equation of the second kind of the non-classical type with time-variable symmetric kernel and limits of integration. The problem as formulated is solved by Yu. M. Mitropol'skiy's asymptotic method. It is shown that the amplitudes of the dynamic forces in the filament increase in proportion to the square root of the length of the filament. Author's abstract.

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- 6 -

1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--TRANSISTOR GENERATOR OF HIGH SAWTOOTH VOLTAGE -U-  
AUTHOR--GOROSHKOV, B.I.  
COUNTRY OF INFO--USSR  
SOURCE--PRIBORY I TEKHNIKA EKSPERIMENTA, MAR. APR. 1970, P. 135-137  
DATE PUBLISHED-----70  
SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.  
TOPIC TAGS--VOLTAGE AMPLIFIER, SEMICONDUCTOR TRIODE, TRANSISTORIZED  
GENERATOR  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--3005/0390 STEP NO--UR/0120/70/000/000/0135/0137  
CIRC ACCESSION NO--AP0132619  
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0132619

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THEORETICAL ANALYSIS OF THE POSSIBILITY OF CONSTRUCTING A HIGH SAWTOOTH VOLTAGE GENERATOR BY USING SEMICONDUCTOR TRIODES. OUTPUT SIGNAL AMPLITUDES SUBSTANTIALLY HIGHER THAN THE PERMISSIBLE VOLTAGE AT THE ELECTRODES OF THE INDIVIDUAL COMPONENT TRIODES ARE OBTAINED IN AN EXPERIMENTAL TRANSISTORIZED CIRCUIT. DIAGRAMS ARE PLOTTED TO OBTAIN THE PRINCIPAL PARAMETERS OF SUCH CIRCUITS. FACILITY: AKADEMIIA NAUK SSSR, INSTITUT KOSMICHESKIKH ISSLEDOVANII, MOSCOW, USSR.

UNCLASSIFIED

1/2 033

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--TERPOLYMER OF FLUORO SUBSTITUTED STYRENES WITH STYRENE AND WITH  
DIENES -U-

AUTHOR--(05)--ANISIMOVA, V.V., GORSHKOVA, I.A., DOKUKINA, A.F., PETERKIN,  
B.D., SMIRNOVA, Z.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., KHIM. KHIM. TEKHNOL. 1970, 13(2), 256-8

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--POLYMERIZATION, FLUORINATED ORGANIC COMPOUND, STYRENE, DIENE,  
ISOPRENE, COPOLYMER, ELASTICITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--2000/0780

STEP NO--UR/0153/70/013/002/0256/0258

CIRC ACCESSION NO--AP0124449

UNCLASSIFIED

2/2 033

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124449

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INFLUENCE OF COMONOMER MIXT. COMPN. ON THE COMPN. AND PROPERTIES OF THE TITLE TERPOLYMERS WAS STUDIED. EMULSION OR BULK POLYMN. OF STYRENE (I), BUTADIENE (II) OR ISOPRENE (III), AND P PHC SUB6 H SUB4 CF:CF SUB2, PHCF:CFSUB2 (IV), C SUB6 F SUB5 CME:CHSUB2, PHCF: CFCL, OR RPHC SUB6 H SUB4 CF: GAVE 12 HIGH MOL. WT. TERPOLYMERS, IN 17.9-72.4PERCENT YIELDS, WHOSE FLUOROSTYRENE CONTENTS (05.-24PERCENT) WERE SIGNIFICANTLY LOWER THAN THOSE IN THE ORIGINAL MONOMER MIXT. (3.66-49-82 MOLE PERCENT). EMULSION POLYMN. OF A I-II-III MIXT. AND BULK POLYMN. OF I, III, AND C SUB6 F SUB5 CH:CH SUB2 DID NOT GIVE TERPOLYMERS. REACTIONS WITH ISOPRENE REQUIRED SIMILAR TO 4 TIMES LONGER. THE HIGHER THE II CONTENT OF A TERPOLYMER, THE HIGHER ITS MOL. WT. TERPOLYMER CONTG. GREATER THAN 20PERCENT II WERE RUBBERS; FILMS CAST FROM BENZENE SOLN. WERE MORE ELASTIC THAN THOSE OF COPOLYMERS NOT CONTG. II. FACILITY: LENINGRAD. POLITEKH. INST. IM. KALININA, LENINGRAD, USSR.

UNCLASSIFIED



USSR

UDC 537.525

GOROVETS, V. S., RYBAK, S. A.

"Buildup of Microwave Secondary Electron Discharge"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology. Scientific-Technical Collection. Microwave Electronics), 1971, Issue 1, pp 46-51 (from RZh--Elektronika i yeye primeneniye, No 5, May 1971, Abstract No 5A31)

Translation: The process is considered of the buildup of a discharge in a microwave field in a vacuum, taking account of the formation of the space charge which determines the magnitude of the steady secondary-electron discharge. The buildup time of the discharge and the limiting concentration of electrons in the discharge are computed. The concentration of electrons in the steady discharge is proportional to the power of the microwave field and is inversely proportional to the square of the distance between the electrodes. 13 ref. Summary.

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USSR

UDC 533.95.538.4

GOROVITS, V. S.

"Calculation of Forces Acting on a Conducting Particle in Variable Crossed Electric and Magnetic Fields"

V sb. 7-ye Sovesh. po magnit. gidrodinamika. T. 3 (Seventh Conference on Magnetohydrodynamics. Vol 3 -- Collection of Works), Riga, "Zinatne," 1972, pp 167-169 (from RZh-Fizika, No 11, Nov 72, Abstract No 11G18)

Translation: The effect of variable crossed electric and magnetic fields on a drop of mercury placed in an electrolyte is discussed. At low values of the electric field strength  $E$  the mercury in the acid solutions has a low conductivity. Dissolution of the mercury begins at the anode segments of the drop with an increase of  $E$ . The mercury ions are transferred to the cathode segment by vortex flows, and the current through the drop is an exponential function of  $E$ . The force acting on a particle in variable low-frequency fields; i.e., with a low capacitance current through the phase interface was calculated considering the experimental dependence of the relative conductivity  $\beta = \sigma_1 - \sigma_2 / 2\sigma_1 + \sigma_2$  (where  $\sigma_1$  is the conductivity of the liquid and  $\sigma_2$  is the conductivity of the particle) on the electric field strength  $E$ . The regions for the effective use of MHD separators with alternating and direct current were determined from these results. V. L. Martyn'yan.

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Acc. Nr: **AP0047190**

Ref. Code: **UR0511**

PRIMARY SOURCE: Stomatologiya, 1970, Vol 49, Nr 1 , pp 8687

**B. Ya. Gorovoy, G. A. Milovanov, Yu. P. Gusev, E. P. Gusev** — THE EMPLOYMENT OF DENTOXIDE FOR REINFORCEMENT OF NONREMOVABLE PROSTHESES

Summary. For the reinforcement of nonremovable prostheses the authors employed a preparation from the group of self-setting epoxy resins — dentoxide — endowed with good adhesion, absence of toxicity for the dental pulp and not dissolving in the oral cavity. Dentoxide was used in accordance with the instruction. Observations over 124 patients showed good fixation of bridge prostheses.

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REEL/FRAME

**19790689**

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USSR

UDC: 577.4

GOROVOY, V. R.

"Diagnosis of Relay Devices When Failures are Represented by Tests of Individual Elements"

Tr. IV Vses. soveshch. po avtomat. upr., 1968, Tekhn. sredstva avtomatiki  
(Works of the Fourth All-Union Conference on Automatic Control, 1968, Technical Facilities for Automation), Moscow, "Nauka", 1971, pp 44-57 (from RZh-Kibernetika, No 4, Apr 72, Abstract No 4V388)

[no abstract]

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USSR

GOROYAN, T. A., KHACHIYAN, E. Ye.

"Earthquake Resistance of Multistory Frame Buildings with Rigidity Decreasing with Each Successive Story"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR, Seriya Tekhnicheskikh Nauk, Vol 25, No 3, 1972, pp 35-43.

Abstract: The frequency equations of multistory frame buildings with absolutely rigid beams and a linear decrease in rigidity of each successive story are analyzed. A formula is suggested for determination of the periods of the first three lowest harmonics of free oscillations of buildings of this type up to twenty stories high. The forms of oscillations of the buildings are studied. The stress states of specific ten story reinforced concrete frame buildings are studied using accelerograms of four California earthquakes of 7 to 8 units intensity in order to estimate the earthquake resistance of buildings with rigidity decreasing with height. It is noted that a decrease in rigidity with height causes significant modification of the stress state of the upper stories during earthquakes.

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USSR

UDC 69.032+669.841+624.159.1

GOROYAN, T. A., KHACHIYAN, E. YE., Armenian Scientific Research Institute of Building Materials and Structures

"Analysis of the Response of Multistory Frame Buildings to Seismic Disturbances on the Basis of Accelograms of Strong Earthquakes"

Yerevan, Izvestiya Akademii nauk Armyanskoy SSR, Seriya tekhnicheskikh nauk, No. 4, 1971, pp 3-12

Abstract: A method is given for calculating the response of multistory buildings to seismic disturbances by using accelograms of earthquakes and applying a computer. The relative effect of different shapes of buildings and the scattering of energy on the magnitude of the seismic loads is analyzed using specific examples of 10-story frame buildings. The spectral method of calculating buildings for seismic disturbances gave satisfactory results only for systems with one degree of freedom but in the case of a system with many degrees of freedom there arise many difficulties in attempting to calculate the pile-up of higher forms of oscillations. An exact calculation of the

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- . GOROYAN, T. A., KHACHIYAN, E. YE., Izvestiya Akademii nauk Armyanskoy SSR, Seriya tekhnicheskikh nauk, No. 4, 1971, pp 3-12

effect of higher forms of oscillations on the magnitude of the seismic load is complicated chiefly due to the impossibility of a mathematical description of the law of soil vibrations in earthquakes. A computer is applied to overcome these difficulties by making it possible to integrate numerically the expression for the seismic load and to determine the maximum values of this load considering phase deviations of all its components, by using a given accelogram of the earthquake as a basis of the calculation. Four California earthquakes of intensity 7-8 points were used to analyze the relative effect of energy scattering and different shapes of oscillations on the formation of seismic loads in specific types of 10-story reinforced concrete frame buildings.

USSR

. UDC: None

GOROYAN, T. A.

"Considering Foundation Pliability in Determining Free Oscillation Periods of Building Frameworks"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR--Seriya tekhnicheskikh nauk, Vol. 23, No. 6, 1970, pp 43-45

Abstract: In an earlier paper (Goroyan, T. A., et al, A opredeleniya periodov svobodnykh kolebaniy anogotazhnykh karkasnykh zdaniy -- Determining Free Oscillation Periods of Multistory Building Frameworks -- Izvestiya Armyanskoy SSR--Seriya TN, Vol. 23, No. 5, 1970) the author developed a formula for determining the period of the first three tones in the free oscillations of multistory building frameworks with absolutely rigid beams and different masses for each story, when the rigidity of the first floor differs from that of the other floors. In deriving that formula, the assumption was made that the foundation was not pliable. The present article makes the same investigation under the assumption that the building foundation is pliable. It is further assumed that the foundations are rigid masses and are symmetrical with respect to the vertical plane, and that during the building oscillations the total load applied to the foundation causes no stretching stress at the base. 1/1



USSR

UDC 534.833

GOROYAN, T. A., Armenian Scientific Research Institute of Building Materials and Structures

"Accounting for Attenuation in Research on the Oscillation of Nonlinear Dissipative Systems"

Yerevan, Doklady Akademii Nauk Armyanskoy SSR, No 1, 1970, pp 3-6

Abstract: An experimental investigation of free flexural oscillation of reinforced concrete columns 20 x 14 cm in cross section and free length of 2.5 m was made with the aim of accounting for the attenuation. Results similar to those obtained in the article for light and heavy reinforced concrete can be obtained for other materials as well. 1 table, 3 bibliographical entries.

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USSR

GOROYAN, T. A. and KHACHIYAN, E. YE.

"Determination of Periods and Forms of Free Oscillations of Multi-Story Frame Buildings"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR, Seriya Tekhn. Nauk, Vol 23, No 5, 1970, pp 43-51

Abstract: In an earlier work, the authors suggested a formula for determination of the first three tones of the free oscillations of buildings up to 20 stories high. Subsequently, they showed that for buildings of over five stories, the influence of differences of masses of individual stories within limits of 20-30% can be ignored, and the periods and forms of oscillations determined as for systems with equal masses in all stories. Continuing these studies, this article presents an analysis of the free oscillations of buildings in which the rigidity of the first story differs from the rigidities of the other stories, which are equal to each other.

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USSR

UDC 577.3

TOROPTSEV, I. V., GARCANEYEV, G. P., GORSHENINA, T. I., and TEPLYAKOVA, N. L.

"Pathological Anatomical Description of Changes Arising in Experimental Animals Under the Influence of Magnetic Fields"

Vliyaniye Magnitnykh Poley na Biologicheskiye Ob"yekty, pp 98-107

Abstract: A comparison of all morphological changes in the organs and tissues of laboratory animals studied revealed that the male sex glands have the greatest sensitivity to magnetic fields. Under the influence of this physical factor, there was an impairment of mitosis as a result of which gigantic multinuclear cells appeared in a number of organs (testicles, liver, kidneys, adrenal glands, epithelium of the crystalline lens). The set of morphological changes caused by a magnetic field in the whole organism makes it possible to speak of the specifics of the pathological anatomical picture. A study of morphological changes in dynamic terms revealed a manifest tendency to normalize impaired structures in organs and tissues after the effect of the magnetic fields stops. The biological effectiveness of pulsed and intermittent magnetic fields was higher than constant magnetic fields. The pathological changes in a number of organs and systems which arise under conditions of the magnetic fields tested are not catastrophic.

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GOROZHANIN, L. S.

physiology

EFFECT OF OXYGEN TENSIDACY ON THE ERYTHROCYTIC SYSTEM IN SHUNTORIZED DOGS

[Article by L. S. Gorozhanin, Moscow, Komunisticheskiy Meditsinskiy Zhurnal, No. 1, 1971, pp. 83-85, submitted for publication 4 July 1960]

UIC 612-111.1-06:612-273.1-612.412

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SD:SPRS 67081  
19 JUN 71

Eleven splenectomized dogs in three different age groups (adults, ages 4-7 and 1-2 months) were subjected at different times after the operation to single and repeated exposures to a reduced partial pressure of oxygen in the inhaled air equal to 96 mm Hg ("ascent" in a pressure chamber to 8,000 m for 2 hours a day for 6 to 12 days). The content of hemoglobin, number of the erythrocytes and reticulocytes, hematocritic index, and acid tolerance of the erythrocytes was determined in the blood of these animals. In addition, bone marrow punctates and the functional state of erythrocytes were analyzed using Fe<sup>59</sup> (the study was made in collaboration with B. M. Chistyakov).

Under these conditions the intact dogs aged 2 to 3 months exhibited an acute erythrocytic and reticulocytic reaction and after 4 days of "ascent" the background indices of the red blood increased due to stimulation of erythropoiesis (Yu. V. Nikolayevskiy, L. S. Gorozhanin).

In the dogs in the first group a single 2-hour hypoxic state during the year did not cause erythrocytosis or reticulocytosis (Table 1, a); the acid tolerance of erythrocytes remained constant or decreased. In experiments with six "ascents" there was also no increase in the number of erythrocytes, hematocritic index and hemoglobin content. A reticulocytic reaction with a shift of the formula to the left persisted (Table 2). In most cases the acid tolerance of the erythrocytes decreased. The maximum entry of Fe<sup>59</sup> into the blood was observed on the sixth day, whereas in the intact animals subjected to hypoxia it was observed on the fourth day. The bone marrow punctates revealed a decrease in the myeloid-erythroid index, and also an increase in the percentage of mitoses in red cells. A year after the splenectomy one dog exhibited a restoration of erythropoietic (but not reticulocytic) reaction to hypoxia; normalization of blood composition did not occur for 5 weeks, whereas in healthy dogs it occurred after 6 (less frequently 11) days.

USSR

UDC: 621.396.69:621.318.4(088.8)

PANOV, Yu. A., ANTONOV, V. P., GOROZHANIN, Yu. A.

"An Inductance Coil"

USSR Author's Certificate No 266869, filed 24 Sep 68, published 15 Jul 70  
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1V324 P)

Translation: The proposed inductance coil is made in the form of two helical windings which are mutually coaxial and contains a regulating element. In order to regulate the inductance of the coil, this element is made in the form of a cylindrical shield placed between the windings of the coil.

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GOROZHANKINA, T.S.

MEDICINE

LIVE TICKBORNE ENCEPHALITIS VACCINE. I. REACTOGENICITY, SPECIFIC SAFETY AND EFFECTIVENESS

UDC 615.371:576.858.25

19 Aug 1972

Article by A. V. Dubov, T. S. Gorozhankina, et al., Tyumen' Research Institute of Infectious Pathology and Encephalitis Control Group, RSFSR Ministry of Health; Moscow, Voprosy Virologii, Russian, No 1, 1972, submitted 1 September 1970, pp 23-26]

In 1969 a live tickborne encephalitis vaccine was tested for the first time in the USSR in a controlled epidemiological trial. The preparation was found to produce few side effects and was safe for the entire adult population possessing basic immunity. It was quite effective when used in highly intensive test of tickborne encephalitis.

The history of the struggle against infectious diseases has shown that live vaccines are highly effective against a number of viral diseases, e.g., measles, poliomyelitis, and yellow fever. A live tickborne encephalitis vaccine is now urgently needed because it is difficult to use inactivated cultural vaccine for large-scale immunization owing to the necessity for 3 inoculations and subsequent annual revaccinations [1, 9, 10, 11].

Live tickborne encephalitis vaccine was prepared from the Yelantsev strain of tickborne encephalitis virus that was isolated in 1964 in Tyumen'skaya Oblast by A. V. Dubov and E. Z. Dilatova from the blood of a healthy person who had removed from himself a sucking tick [5, 6, 17]. Experimental studies on the biological, antigenic, and immunogenic properties of this virus prepared the way for a trial of the safety, reactogenicity, and antigenic activity of the preparation in volunteers [7, 8, 17]. After examining the results of the trial, the Committee for Vaccines and Sera, USSR Ministry of Health, approved on 14 March 1969 the Temporary Interpublic Technical Requirements (MTU-42) for live tickborne encephalitis cultural vaccine from the Yelantsev strain and regulations for laboratory production. It also authorized a test of the preparation in an epidemiological trial.

Material and Procedure. The epidemiological trial was conducted in 1969 according to the World Health Organization standards [2-4, 13, 14, 16]

USSR

UDC: 621.317:621.391.822

GROZHDANOV, D. P., PUODZHYUKINAS, A. A.

"Signal-to-Noise Ratio in Modulation Noise Factor Meters"

Tr. Nauch.-tekhn. konferentsii "Radioelektronika" (Works of the Scientific and Technical Conference on Radio Electronics), Vol. 6, Kaunas, 1970, pp 101-107 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6A270)

Translation: The paper discusses the signal-to-noise ratio in modulation noise factors meters in the case of individual measurement of the noise factors of microwave amplifiers, as well as the receivers as a whole. Resumé.

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USSR

UDC: 621.317:621.391.822

GOROZHDANOV, D. P., PUODZHYUKINAS, A. A., STARIKOV, B. D.

"On the Problem of Measuring Noise Temperatures in Low-Noise SHF Receivers"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 2 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 2), Novosibirsk, 1970, pp 21-22 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A319)

Translation: The authors present a schematic diagram for measuring low noise temperatures in SHF receivers with the use of a cold load and connection of a noise generator through a directional coupler. A formula is given for determining the error in noise temperature measurement. Analysis shows the appreciable effect of some parameters of the directional coupler on error. It is concluded that the directional coupler must satisfy rigid requirements. E. L.

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Welding

USSR

UDC 621.791.011.053

IL'YSEVICH, S. A., and GORPINCHENKO, V. M., Central Scientific Research Institute of Construction Design imeni V. A. Kucherenko

"Fatigue Strength of Joints in Tubular Welded Constructions"

Kiev, Avtomaticheskaya Svarka, No 8, Aug 70, pp 32-36

Abstract: The results are given for experimental investigations of the fatigue strength of tubular welded constructions. The purpose of these investigations was to obtain data for calculating the strength of tubular welded constructions taking into account actual working conditions. The investigations were conducted in two stages. The first involved fatigue strength studies of tubular joints in relation to a series of geometrical characteristics. The second involved determination of the fatigue of full-size typical tubular welded joints. A detailed description is given of the experimental technique and types of welded joints. Full separation of the extended angle brace was the criterion of fatigue failure of a joint. The fatigue strength of K-shaped joints with cylindrical components (KTs-1 series) was approximately twice that of K-shaped joints with fully flattened ends (KL-1 series).

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USSR

UDC 669.14.018.85.001.6

GORSHENIN, A. P., and GORSHENIN, P. A.

"Experimental Plant and the Investigation Method of Reflection Characteristics of Heat-Resisting Materials Applied in Heat Engines"

V Sb. "Novyye Tekhnol. Protsessy v Mashinostr." [In the Collection "New Technological Processes in Mechanical Engineering"], Moscow, 1971, pp 14-15 (from Referativnyy Zhurnal, No 10, Oct 72, 49. Turbostroyeniye. Single Issue. Abstract No 10.49.186)

Translation: An investigation is made of the principal scheme and the construction of a vacuum-electric plant in which specimens heated up to high temperatures in vacuum can be analyzed, the actual surface temperature and the brightness temperature of the surface being measured with the help of a calibrated pyrometer. To avoid a sublimation of graphite materials, the possibility to conduct the experiments in an inert medium is provided. A method to determine the integral semispherical and spectral blacknesses of heat-resistant-materials is indicated.

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1/2 045 UNCLASSIFIED PROCESSING DATE--11DEC70  
TITLE--INFLUENCE OF INJECTOR CHARACTERISTICS, TEMPERATURE, AND THE FUEL'S  
PHYSICOCHEMICAL PROPERTIES ON THE COMBUSTION EFFICIENCY IN THE  
AUTHOR--(02)-DUBLYKIN, N.F., GORSHENIN, A.P.

COUNTRY OF INFO--USSR

SOURCE--AVIATSIENNAIA TEKHNIKA, VOL. 13, NO. 1, 1970, P. 97-104

DATE PUBLISHED-----70

SUBJECT AREAS--PROPULSION AND FUELS

TOPIC TAGS--GAS TURBINE, GRAPHIC TECHNIQUE, CHEMICAL COMPOSITION,  
COMBUSTION CHAMBER, THERMAL EFFECT, PHYSICAL CHEMISTRY PROPERTY, FUEL  
CONSUMPTION, FUEL INJECTOR, FUEL EFFICIENCY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605060/B12 STEP NO--UR/0147/70/013/001/0097/0104

CIRC ACCESSION NO--AP0144340

UNCLASSIFIED

2/2 045

UNCLASSIFIED

PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0144340

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE COMBUSTION EFFICIENCY IN GAS TURBINE ENGINE CHAMBERS AS A FUNCTION OF INJECTION QUALITY, TEMPERATURE, VAPORIZATION, VISCOSITY, CHEMICAL COMPOSITION, AND OTHER FUEL CHARACTERISTICS. THE STUDY IS BASED MAINLY ON EXPERIMENTAL DATA OBTAINED WITH FULL SCALE TURBINE ENGINES. GRAPHS SHOW FUEL COMBUSTION EFFICIENCY PLOTTED AGAINST THE SPECIFIC SURFACE AREA OF FUEL DROPLETS, THE EXCESS AIR RATIO, SINGLE NOZZLE AND BYPASS FUEL INJECTION SYSTEMS, AND FUEL TEMPERATURE. IT IS DEMONSTRATED THAT COMBUSTION EFFICIENCY DEPENDS MAINLY ON THE FRACTIONAL COMPOSITION, DEGREE OF ATOMIZATION, AND FUEL VAPORIZATION. THESE FACTORS CANNOT BE NEGLECTED, PARTICULARLY IN ADVERSE CONDITIONS OF LOW PRESSURE AND HIGH FLOW RATES IN THE CHAMBER. IN PRACTICE, COMBUSTION EFFICIENCY CAN BE IMPROVED AND DIFFERENCES IN FUEL PROPERTIES CAN BE MINIMIZED BY VARYING THE INJECTION AND ATOMIZATION.

UNCLASSIFIED

USSR

UDC 669.14.018.85.001.6

GORSHENIN, A. P., and GORSHENIN, P. A.

"Experimental Plant and the Investigation Method of Reflection Characteristics of Heat-Resisting Materials Applied in Heat Engines"

V Sb. "Novyye Tekhnol. Protsessy v Mashinostr." [In the Collection "New Technological Processes in Mechanical Engineering"], Moscow, 1971, pp 14-15 (from Referativnyy Zhurnal, No 10, Oct 72, 49. Turbostroyeniye: Single Issue. Abstract No 10.49.186)

Translation: An investigation is made of the principal scheme and the construction of a vacuum-electric plant in which specimens heated up to high temperatures in vacuum can be analyzed, the actual surface temperature and the brightness temperature of the surface being measured with the help of a calibrated pyrometer. To avoid a sublimation of graphite materials, the possibility to conduct the experiments in an inert medium is provided. A method to determine the integral semispherical and spectral blacknesses of heat-resistant-materials is indicated.

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USSR

UDC: 539.3

SANKIN, Yu. N., ARNAUT, V. P., GORSHENINA, G. N., UGLEVA, O. N.

"Concerning a Numerical Method in the Nonlinear Theory of Thin-Walled Elastic Shells"

Tr. Ul'yanovsk. politekhn. in-ta (Works of the Ul'yanovsk Polytechnical Institute), 1972, 8, No 2, pp 191-202 (from RZh-Mekhanika, No 9, Sep 72, Abstract No 9V73)

Translation: It is proposed that Newton's iteration process be used to solve nonlinear equations of equilibrium of shells of revolution which can not be considered flat, and whose stressed state is described by modified Reissner equations (E. L. Aksel'rad, Izv. AN SSSR. Otd. tekhn. n. Mekhan. i mashinostr., 1960, No 4, pp 84-92 -- RZhMekh 1961, 6V41). The effectiveness of this method is evaluated on the example of solution of a system of nonlinear equations for a flat diaphragm. As a result of intercomparison of initial approximations and the behavior of discrepancies in differential operators, it is concluded that the given iteration process converges satisfactorily. L. A. Shapovalov.

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USSR

UDC: 621.373:621.396.662

GORSHENKOV, Yu. N., DEM'YANCHENKO, A. G.

"On a Method of Designing Oscillators With Precision Frequency Control"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 3 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 3), Novosibirsk, 1970, pp 85-86 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1A419)

Translation: Frequency control within extremely narrow limits (of the order of  $10^{-7}$  of the main frequency) in an oscillator is practically impossible by conventional methods. It is proposed that two oscillators mutually synchronized on frequency multiples be used for this purpose. One of the oscillators operates in the mode of frequency multiplication of the other, and conversely the other oscillator operates in the mode of division of the frequency of the first. The operation of such a system is explained, and it is pointed out that it can be made for any frequency band by using any harmonic oscillators. Bibliography of two titles. E. L.

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1/2 015  
UNCLASSIFIED  
TITLE--ANTISEPTIC FOR RAPID SATURATION OF WOOD -U- PROCESSING DATE--27NOV70  
AUTHOR--(03)-GORSHIN, S.N., KRAPIVINA, I.G., ALIYEV, A.M.  
COUNTRY OF INFO--USSR  
SOURCE--USSR 263,851  
REFERENCE--OTKRYTYYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--10FEB70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--CHEMICAL PATENT, FUNGICIDE, CHLORINATED ORGANIC COMPOUND,  
PHENOL, WOOD  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3006/1590 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0135231  
UNCLASSIFIED



2/2 015  
CIRC ACCESSION NO--AA0135231

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE ANTISEPTIC, HAVING INCREASED PROTECTIVE PROPERTIES, HAS THE FOLLOWING COMPN. (IN WT.PERCENT). PENTACHLOROPHENOL 3-5, GREEN OIL 14-22, AND LIGHT PETROLEUM PRODUCTS (E.G. WHITE ALC., LIGOINE KEROSENE FRACTIONS ACCORDING TO THE ALL UNION STATE STANDARD 10227-62, OR LIGROINE) 73-83.

UNCLASSIFIED

USSR

UDC 669.71'721'782

GREBENKIN, V. S., SIL'CHENKO, T. V., GORSHKOV, A. A. and DZYKOVICH, I. YA.,  
Institute of Casting Problems, Academy of Sciences Ukrainian SSR

"Effect of Magnesium on Tin and Lead Distribution in Aluminum-Silicon Alloys"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 3, 1972,  
pp 50-54

Abstract: The impurities in secondary aluminum alloys include readily fusible and liquation-prone  $\beta$ -type elements such as Sn, Pb, As, Sb (up to 0.1-0.2% of each) which appear to impair the mechanical properties of the alloys at both room and higher temperatures. Alkaline, alkali-earth, transition (Ti, Zr, V), and rare-earth elements form chemical compounds with the  $\beta$ -type elements and under certain conditions neutralize their adverse effect in the alloys. This study involving Al-Si-Mg alloys with Sn and Pb additions to the Mg Si-type phase revealed appreciable amounts of Sn and Pb which had affected the phase composition and changed it to  $Mg_2Si_{0.3\beta}^{0.7}$  ( $\beta$  = Sn or Pb). In Al-Si-Cu-Mg alloys Pb and Sn act to hinder the formation of the quaternary phase  $W(Al_xMg_5Cu_4Si_4)$  while promoting the

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USSR

GREBENKIN, V. S., et al, Metallovedeniye i termicheskaya obrabotka metallov, No 3, 1972, pp 50-54

formation of the  $Mg_2Si$  phase which also contains Cu, Sn and Pb. In Al-Si-Cu-Mg alloys, Sn hinders while Pb promotes the formation of the  $CuAl_2$  phase. There were no inclusions of free Sn in the Al-Si-Mg and Al-Si-Cu-Mg alloys. Despite the low Mg contents in the chemical compounds, they appear to have combined the entire tin. The study shows that both Sn and Pb are electronic analogs of Si. They are capable of substituting for Si in  $Mg_2Si$  or  $W(Al_xMg_5Cu_4Si_4)$ -type magnesium compounds, making it possible to neutralize the adverse effect of Sn and Pb in aluminum alloys. (1 illustration, 3 tables, 14 bibliographic references).

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USSR

UDC 669.721.5.884.018.28.29

KOZENKO, P. S., GORSIKOV, A. A.

"Study of Hot Brittleness of Magnesium-Lithium Alloys"

Usadochn. Protsessy v Splavakh i Otlivkakh [Shrinkage Processes in Alloys and Castings -- Collection of Works], Kiev, Nauk. Dumka Press, 1970, pp 306-308. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5, 1688 by the authors).

Translation: Results are presented from studies of hot brittleness of Mg-Li alloys; recommendations are given for its reduction. 3 figs; 5 biblio refs.

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USSR

UDC 669.721'834.042.6

KOZENKO, P. S., CORSHKOV, A. A.

"Shrinkage of Magnesium-Lithium Cast Alloys"

Usadochn. protsessy v splavakh i otlivkakh -- V sb. (Shrinkage Processes in Alloys and Castings -- collection of works), Kiev, Naukova Dumka Press, 1970, pp 336-337 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G222)

Translation: A study was made of the linear shrinkage of Mg alloys with Li in the  $\beta$ -solid solution region as a function of the alloying additives. The linear shrinkage of the indicated alloys is close to the shrinkage of standard alloys based on Mg.

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USSR

UDC 669.715'782.018.25

SAP'YAN, V. G., and GORSHKOV, A. A., Institute of Casting Problems, Academy of Sciences Ukrainian SSR

"Prospects for the Use of Modified Hypereutectic Silumins"

V sb. Modifitsir. siluminov (Modification of Silumins -- Collection of Works), Kiev, 1970, pp 53-55 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1751 by I. NABATOVA)

Translation: The authors demonstrate the necessity of treating hypereutectic Silumins with 16-26% silicon content in order to make brake shoes, pistons, bushings, cylinder heads, and other parts of internal combustion engines that operate under a forced regime (high temperature, intensified wear). The advantages of hypereutectic Silumins as compared with Al-Si eutectic alloys are heightened resistance to heat, resistance to wear, heat conductivity, and fluidity. A search must be made for an effective modifier of hypereutectic Silumins, as well as for ways of heightening their resistance to heat and thus of increasing the reliability and durability of castings made from them. Bibliography of five titles.

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USSR

UDC 669.715'782:[620.186 + 539.531]:669.781'779

GORSHKOV, A. A., SAP'YAN, V. G., SIL'CHENKO, T. V., CHERNOGORENKO, V. B., and GREBENKIN, V. S.

"Influence of Phosphides  $A^{III}B^V$  on the Structure and Certain Properties of Hypereutectic Silumins"

V sb. Modifitsir. siluminov (Modification of Silumins -- Collection of Works), Kiev, 1970, pp 77-82 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1749 by I. NABATOVA)

Translation: By microanalysis and microhardness methods the authors investigated the modifying and alloying action of phosphides of the type  $A^{III}B^V$  (BP, AlP, GaP, ZnP) on hypereutectic Silumins containing (in %): Si 18, Cu 2.08, Mg 0.4, Ni 1.05, Mn 0.12, Zn up to 0.3, and Fe 0.42. Phosphides were introduced at melt temperature of 800° in an amount constituting 0.4% of the weight of the alloy. Modification time, 2-3 minutes; subsequent homogenization time at 800°, 30 minutes. BP and AlP significantly reduce alloy structure; GaP has less effect on structure, and ZnP very slight effect, which is due to the different phosphorus content of the phosphides. BP and AlP occur in silicon in the form of solid solutions and increase the microhardness of primary silicon  
1/2

USSR

GORSHKOV, A. A., et al, Modifitsir. siluminov (Modification of Silumins -- Collection of Works), Kiev, 1970, pp 77-82 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1749 by I. NABATOVA)

crystals to H 50/5 1600 and 1460 respectively. GaP and ZnP raise H 50/5 to 1190 and 1170 due to the formation of AlP, which becomes part of the silicon lattice. Total hardness of alloys does not vary after modification. One illustration. Two tables. Bibliography of 23 titles.

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USSR

UDC 533.6.013.42

GORSHKOV, A. G., GRIGOLYUK, E. I.

"Nonstationary Problems in the Theory of Shells Loaded in a Liquid"

V sb. Nauch. konf. in-t mekh. Mosk. un-ta, Moskva, 22-24 maya 1972 g.  
Tezisy dokl. (Scientific Conference. Institute of Mechanics of Moscow  
University, Moscow, 22-24 May 1972. Topics of Papers -- Collection of  
Works), Moscow, 1972, p 15 (from RZh-Mekhanika, No 8, Aug 72, Abstract  
No 8V299)

Translation: The stress and deformation state of a thin elastic cylindrical shell with rigid elements on which an axial shock wave of low intensity is incident (the wave front is plane) is investigated. Rigid bodies of rotation are fastened at the ends of the shell (a sphere, cylinder, cone, paraboloid of rotation). There are additional concentrated loads inside the shell on the axis of symmetry which are connected with the end frames of the shell by elastic springs and dampers. The fluid is considered an ideal acoustical medium. The hydrodynamic forces are determined approximately on the basis of a linear approximation of the transfer functions  $\phi(\tau)$  for pressure. Refined equations from the theory of thin shells for finite bending considering transverse shifts and the inertia of rotation

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USSR

- GORSHKOV, A. G., GRIGOLYUK, E. I., Nauch. konf. in-t mekh. Mosk. un-ta, Moskva, 22-24 maya 1972 g. Tezisy dokl., Moscow, 1972, p 15

are applied in compiling the equations of motion of the entire structure. The resulting system of equations is iterated numerically by finite differences and the Kutta-Merson method. Calculations were made for stepped waves and for waves of exponential profile. The effect of the basic parameters of the shell on the characteristics of the reaction was studied.

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USSR

UDC: 533.6.013.44

GRIGOLYUK, E. I., Corresponding Member, Academy of Sciences, USSR, ~~GOSSNIPOL~~  
A. G.; Production and Scientific Research Institute of Engineering Research  
in Construction, State Committee for Construction, USSR

"The Action of an Acoustic Pressure Wave Upon an Elastic Conical Shell  
Fastened in a Screen"

Moscow, Doklady Akademii Nauk SSSR, Vol 202, No 5, 11 Feb 72, pp 1028-1030

Abstract: Difficulties arise during the analysis of transient processes in conical shells immersed in a liquid when they are acted upon by shock waves (the presence of a vortex, variable coefficients in equations of movement of the shell). The article deals with the simplest case of the interaction of a thin elastic truncated conical shell with a plane acoustic stepwise pressure wave, propagating along the axis of the shell (an axisymmetric problem). It is assumed that the shell is fastened in an absolutely rigid immovable screen. Compilation of the equations of motion of the conical shells proceeds from refined nonlinear equations of the theory of thin shells of revolution, such as those used by S. P. Timoshenko. The equations of motion for the case of rigid fastening of the ends at zero initial conditions were integrated by the method of straight lines by means of the method of Euler

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USSR

GRIGOLYUK, E. I. and GORSHKOV, A. G., Doklady Akademii Nauk SSSR, Vol 202, No 5, 11 Feb 72, pp 1028-1030

Marson (with automatic selection of the step with respect to time). The solution algorithm was programmed in terms of ALGOL-60 and was worked out on the BESM-6 electronic computer. Numerical calculations were conducted for a steel shell immersed in water. A graph is given of curves of shifting  $U$ , normal deflection  $W$ , the force  $M_1$ , and the moment  $M_2$  in the time moment  $\tau \sin \beta$ . Another graph presents curves of velocities  $W$  for various time moments. 2 figures, 3 references.

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GRIGOLYUK, E. I., GORSHKOV, A. G.,

"Interaction of Weak Shock Waves With Elastic Structures"

Nauchn. tr. In-t mekh. Mosk. un-ta (Scientific Transactions, Moscow University Institute of Mechanics) 1970, No. 2, 160 pp, illustrated (from RZh-Mekhanika, No. 2, Feb 71, Abstract No. 27417)

Translation: In this monograph, the problems of the interaction of plane stationary acoustical pressure waves with fine elastic shells immersed in an ideal (nonviscous and nonconductive to heat) fluid are considered. The work consists of seven chapters and "Appendices." In the first chapter, the basic hypotheses are adduced and the necessary information on the equations of motion of the fluid and the shells is given. The contact problem of the hydroelasticity is solved in two stages. The first stage (Chapters 2, 3, 4) is connected with the determination of the external hydrodynamic forces on the shell. The hydrodynamic problem is solved in its linear statement. The pressure on the shell is put in the form of a sum of the pressure acting on the absolutely rigid shell immovable in space, and the pressure caused by the elastic deformations of the shell and its movement as a rigid body. The second stage (Chapters 5, 6, and 7) is connected with an investigation of the dynamic strength under already known loads. This problem 1/3 is given in linear and nonlinear statements. The second chapter is devoted to problems of the diffraction of plane shock waves on rigid barriers. The problem is solved with the use of the inte-

USSR

GRIGOLYUK, E.I., et al, Nauchn. tr. In-t mekh. Mosk. un-ta 1970, No 2, 160 pp, (from RZh-Mekhanika, No 2, Feb 71, Abstract No 2V417)  
 integral Laplace transform with respect to time. An accurate analytical solution is given for a series of surfaces. The asymptotic estimates of the obtained results are analyzed. An approximate formula is derived for the hydrodynamic pressure acting on an absolutely rigid shell formed by the rotation of the positive Gauss curve. The radiation pressure on cylindrical and spherical shells is analyzed in Chapter 3. The determination of the potential of the radiated waves for specified elastic deformations of the shell and the derivation of approximate formulas for the radiation pressure are achieved by methods similar to those used in diffraction problems (Chapter 2). In the fourth chapter, the pressure on the surfaces of hard bodies moving in a fluid is determined. The motion of a rigid sphere and cylinder in the fluid under the action of a shock wave is investigated.

The succeeding chapters are devoted to problems of the dynamic stability for those shells which are most interesting from the point of view of practical applications. The action of shock waves on closed circular cylindrical shells (Chapter 5), on closed spherical shells and spherical panels (Chapter 6), and 2/3 on cylindrical panels (Chapter 7), is considered. A discussion

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USSR

GRIGOLYUK, E.I., et al, Nauchn. tr. In-t mekh. Mosk. un-ta 1970, No 2, 160 pp  
(from RZh-Mekhanika, No 2, Feb 71, Abstract No 2V417)

is given of various methods of solving shell oscillation equations. For closed cylindrical shells, solutions are given in linear and nonlinear approximations. The effect of the various factors is estimated. The peculiarity of nonlinear equations of motion for shells is that they take into account the shift of the shell as a solid body in more correct form than can the known solutions. For a closed spherical shell and a slanting spherical panel, solutions are obtained in linear form. In the investigation of the action of shock waves on an elastic cylindrical panel attached to a rigid cylindrical screen and placed in a limitless ideally compressible fluid, use is made of equations of finite buckling from the theory of fine and nonslanting shells. The Bubnov method is used for a slanting rectangle in the plane of a panel. In the case of a nonslanting panel, the method of finite differences is used.

In the "Appendices," a review is given of the literature on problems connected with those considered in the book, and a number of new problems requiring solution are indicated. Bibliography of 236. Yu. G. Balakirev

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USSR

GORSHKOV, A. G., GRIGOLYUK, E. I., Moscow

"Impact of a Spherical Shell Against the Surface of a Liquid"

Moscow, IAN SSSR, Mekhanika Zhidkosti i Gaza, No 6, Nov/Dec 70,  
pp 90-93

Abstract: The authors study the problem of vertical impact of a mildly sloping spherical shell against the surface of an ideal incompressible liquid. The shell is supported at the edge by an elastic former which is fastened to a rigid body of mass  $M_0$  which is much greater than the mass  $m_0$  of the shell. It is assumed that the initial impact velocity  $v_0$  is small in comparison with the speed of sound  $c$  in the liquid. The analysis is restricted to axisymmetric deformations of the shell.

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USSR

UDC 621.791.052:530.152.1:620.192.7:669.295

MATYUSHKIN, B. A., Candidate of Technical Sciences, and GORSHKOV, A. I.,  
Candidate of Technical Sciences

"Effect of Weld Patching on the Resistance of Titanium Alloy Weld Joints to  
Slow Failure"

Moscow, Svarochnoye Proizvodstvo, No 11, 1973, pp 28-30

Abstract: Purpose of this work was to investigate the use of weld patching to eliminate defects resulting during the original welding process and to determine the role of weld patching in the formation of cold cracks and develop recommendations for eliminating cold cracking. Samples of titanium alloys OT4, VT20, and VT14 were weld patched using 2-mm diameter wire grades OT4, VT20-lsv, and SPT-2, respectively. Results from visual inspection and x-ray examination showed that after the first patching there were cracks in the form of fine grids on the seam metal surface of alloy VT14 which had been subjected to maximum stresses (equal to 0.8 of the yield strength) for 80 days and 180 days for VT20. No cracks were found on alloy OT4. After a second patching, small cracks were found in the heat-affected zone for alloy VT14 which had been subjected to maximum stresses equal to 0.7 YS for 180 days and, stresses equal to 0.6 YS for 75 days in the seam metal. No cracks were found on alloy

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USSR

MATYUSHKIN, B. A. and GORSHKOV, A. I., Svarochnoye Proizvodstvo, No 11, 1973, pp 28-30

VT20 after the second patching. After the third patching cracks were found on practically all the samples tested, primarily in the heat-affected zone. Additional tests were conducted on the samples after annealing in argon for 1.5 hours at 750°C and furnace cooling. It was found that the annealing procedure increased the resistance of the weld joints to the formation of cold cracks. As a result of this, after three patchings, no cracks were detected on any of the alloys which had been subjected to maximum stresses equal to 0.8 YS for 2.5 years. Thus it was concluded that repeated heatings of weld joints for patching purposes impair the structural state of the seam and heat-affected zone metal and reduce the resistance of joints to slow failure, and that annealing of weld joints having been subjected to patching lowers the danger of crack formation and development. 3 figures, 2 tables, 2 bibliographic references.

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Mechanical Properties

UDC 621.791.019:546.811

USSR

GORSHKOV, A. I., Engineer, Moscow

"Effect of Pores on the Mechanical Properties of Titanium Alloy Joints"

Kiev, Avtomaticheskaya Svarka, No 5, May 73, pp 49-52

Abstract: VT1, OT4, OT4-2, VT14 and VT15 titanium alloys were argon-arc welded without a filler in order to study the effect of pores on the mechanical properties of weld joints for these alloys. The authors proposed a porosity number scheme to indicate the number, size, and spacing of pores in the weld joints. This pore numbering scheme was as follows: No 1 -- pores less than 0.5 mm in diameter with 45 of them per 100 mm of seam length; No 2 -- less than 0.7 mm, 50 per 100 mm of seam length; No 3 -- less than 1 mm in diameter, 50 per 100 mm; 4 -- less than 1.2 mm in diameter, 60 per 100 mm; 5 -- less than 1.5 mm, 60 per 100 mm. Bar graphs are given for the different alloys which show the effect of pores for different weld seam thickness and varying heat treatment on the mechanical properties of the welded alloys. Strength loss due to pores in the weld joint was calculated by the formula:

$$P = P_0(1 - \gamma_p \epsilon)$$

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USSR

GORSHKOV, A. I., Kiev, Avtomaticheskaya Svarka, No 5, May 73, pp 49-52

where P is joint strength with pores, kg/mm<sup>2</sup>; P<sub>0</sub> -- joint strength without pores, kg/mm<sup>2</sup>;  $\sigma_T$  -- a coefficient depending on temperature of testing and at 20 C,  $\sigma_T = 1$ ; and  $\xi$  -- a coefficient considering sample porosity which is found from the expression:

$$\xi = V_{\text{pore}} / (V_{\text{pore}} + V_{\text{metal}})$$

where V<sub>pore</sub> is metal area with pores, mm<sup>2</sup> and V<sub>metal</sub> is metal area without pores, mm<sup>2</sup>. 5 figures, 1 table, 4 bibliographic references.

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UDC 621.791.011

USSR

GORSHKOV, A. I., MATYUSHKIN, B. A., MESHCHERYAKOV, V. N., and SHORSHOROV,  
M. Kh., Moscow

"Effect of Hydrogen on the Kinetics of Cold Crack Growth in Titanium After  
Welding"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 72, pp 140-143

Abstract: OT4, OT4-2, VT14 and VT20 titanium alloys in the form of disks  
130 mm in diameter and 3 mm thick, were welded and tested to trace the  
development of cracks under a biaxial stress state and the effect of hydro-  
gen on cold cracking. Test data showed that at high rates of crack develop-  
ment the hydrogen content at the crack surface is lowered. This indicates  
that the higher the level of stresses and the lower the ductility of the  
titanium alloys, the smaller the hydrogen concentration required for crack  
development. The effect of oxygen and nitrogen on cold crack development  
was also investigated which showed that with increased content of these two  
elements the rate of crack growth also increases. 3 figures, 1 table, 6  
bibliographic references.

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Titanium

UDC 621.88.085.669.295:620.17

USSR

GORSHKOV, A. I., MATYUSHKIN, B. A., CHUGUNOVA, R. S., and KIRYUKHINA, G. N.

"Properties of VT20 Weld Joints After Annealing"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 4, Apr 73,  
pp 62-63

Abstract: The mechanical properties of weld joints from VT20 alloy with and without a filler metal after annealing at 400-800°C were investigated. It was found that annealing of weld joints made using VT20-lsv or VT20 2sv filler wire and without the filler wire increases ductility although joints made with VT20-lsv wire had greater ductility. An annealing temperature of 800°C was recommended for increasing ductility and removing residual welding stresses. This increase in ductility is explained by the formation of an equilibrium structure of the metal in the heat-affected zone and weld seam and also, possible, by the precipitation of the beta-phase along the boundaries of the alpha- and alpha-prime phases. One figure, two tables.

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USSR

UDC 621.791:62-784.5:621.78.062.3:669.295

GORSHKOV, A. I., and MATYUSHKIN, B. A., Candidates of Engineering Sciences;  
OL'KHOVIK, R. G., AFANAS'YEV, P. S. (deceased), and BEKRENEVA, YE. V.,  
Engineers

"Some Problems of Welding Alloy VT20 in a Controlled Atmosphere"

Moscow, Svarochnoye Proizvodstvo, No 3, Mar 73, pp 20-22

Abstract: The mechanical properties of weld joints and the effect of the protective atmosphere on the gas content in the seam metal during manual welding in a chamber with a controlled atmosphere were investigated in this work. Alloy VT20 sheet, 1-5 mm thick, was used in which the alloying element content and impurity content were found in the following limits (in %): 5.7-6.4 Al, 0.8-1.2 Mo, 0.55-1.22 V, 1.9-2.4 Zr, 0.005-0.01  $H_2$ , 0.07-0.1  $O_2$ , and 0.02-0.03  $N_2$ . Welding rods VT20-2sv of the Ti-Al-Zr-Mo-V system and SPT-2 of the Ti-Al-Zr-V system with a diameter of 2.5 mm were used which had the following chemical composition: VT20-2sv -- 3.98 Al, 2 Zr, 0.83 Mo, 0.91 V, 0.0015  $H_2$ , 0.11  $O_2$  and 0.02  $N_2$ ; SPT-2 -- 4.74 Al, 1.35 Zr, 1.92 V, 0.004  $H_2$ , 0.07  $O_2$  and 0.04  $N_2$ . It was determined that weld joints of alloy VT20 made by automatic and manual welding are close to the base metal in strength and

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USSR

GORSHKOV, A. I., et al, Svarochnoye Proizvodstvo, No 3, Mar 73, pp 20-22

surpass the base metal in impact strength and bend angle. Weld joints 3-5 mm thick made by manual and automatic welding with welding rods VT20-2sv and SPT-2 have a tensile strength equal to 90% of the base metal strength and an impact strength 1.6-2  $\text{kgm/cm}^2$  higher than the base metal impact strength. When welding in chambers without an auxiliary system of argon purification the values of partial oxygen and nitrogen pressures exceed equilibrium values so that there is an additional increase in the oxygen and nitrogen content in the seam metal and a decrease of hydrogen content. 2 figures, 4 tables.

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USSR

UDC 621.791.011:620.192.4:669.295

MATYUSHKIN, V. A., Candidate of Technical Sciences, GORSHKOV, A. I., Candidate of Technical Sciences, SHORSHOROV, M. KH., Doctor of Technical Sciences

"Conditions and Methods of Preventing of Crack Formation From Pores in Titanium Alloys Occurring After Welding"

Moscow, Svarochnoye proizvodstvo, No 11, 1972, pp 46-51

Abstract: A study was made of the conditions of crack formation from pores during prolonged static loading and the possibility of preventing them technologically. In the case under consideration, the cracks are arranged as a rule across the weld perpendicular to the effect of the tensile stresses. Most frequently the cracks are formed in the annular welds where the tensile stresses reach 52-57 kilogram-force/mm<sup>2</sup>. The studies were performed on the titanium alloys VT1-1, OT4, OT4-2, VT20, and VT14 in sheets 3 mm thick. Theoretical and experimental evidence is presented that the formation of cracks from pores depends on the level of the residual stresses in the welded joint, the plasticity index, and the structure of the method. With an increase in the stresses, a decrease in plasticity, and increase in grain size of the metal, the probability of crack formation from the pores increases. A high concentration of stresses in the vicinity of the pore and an increase in the gas content (hydrogen, oxygen, and nitrogen) in the weld metal accelerates the process of crack development

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USSR

MATYUSHKIN, V. A., et al., Svarochnoye proizvodstvo, No 11, 1972, pp 48-51

from the pores with a comparatively low level of general stressed state of the welded structure. Annealing for stress relief with a comparatively small content of gas impurities is one of the basic conditions of preventing crack formation from pores in the weld metal.

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USSR

UDC 539.4:621.791

SHORSHOROV, M. Kh., MATYUSHKIN, B. A., MESHCHERYAKOV, V. N., and GORSHKOV, A. I.  
Moscow

"On the Role of Hydrogen in the Mechanism of Retarded Disintegration of  
Titanium After Welding"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 71, pp 115-120

Abstract: Data are presented from an investigation of the role of hydrogen in the mechanism of the development of cold cracks in welded joints of titanium by retarded disintegration. Experiments were carried out with specimens, 2 X 20 X 80 mm, of the OT4 titanium alloy which, after preliminary lateral bending at angles of 15-90 deg., were subjected to hydrogenation. The relationship between the time up to the destruction of the specimen and the hydrogen concentration on the head of the crack was established experimentally and through calculation. The investigation results are discussed by reference to diagrams showing the effect of the bending angle of the specimen on the H-content of the metal, the H-content on the crack head and the crack length depending on its development time up to disintegration, and the crack length as a function of stress. The retarded disintegration mechanism is essentially affected by the

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USSR

SHORSHOROV, M. Kh., et al., Fizika i Khimiya Obrabotki Materialov, No 5,  
Sep-Oct 71, pp 115-120

hydrogen diffusion caused by the stress gradient. Hydrogen diffuses into the region of maximum stress concentrations and absorbs on defects of the crystalline lattice of the metal, decreasing the surface energy and increasing the development rate of cracks. Six illustr., four formulas, one table, nine biblio. refs.

2/2

UDC 631.547.04

USSR

PRUSAKOVA, L. D., IGNAT'YEV, A. D., and GORSHKOV, A. I., Institute of Plant Physiology, Academy of Sciences USSR, and First Moscow Medical Institute

"Residues of Chlorocholine Chloride in Wheat and Their Toxicological Significance"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 9, No 6, 1971, pp 56-58

Abstract: The authors made a long-term sanitary and toxicological study to determine residues of chlorocholine chloride (CCC) in treated wheat crops and to establish their safety limit for human and animal health. In 1967-1969 field tests, CCC residues were analyzed in the grain and straw of two varieties of winter wheat (wheat-wheat grass hybrid 186 and Mironovskaya 808). It was found that there are no residues of CCC in the grain of wheat treated with doses up to 4 kg/ha, but that in the case of combined treatment with CCC and 2,4-D there are slight residues approximating the limits detected by chemical analysis, including a method as sensitive as thin layer chromatography. The 2,4-D apparently delays somewhat the breakdown of CCC in plants, thus promoting the appearance of insignificant residues. Recommendations for the use of CCC in agriculture must be strictly observed so as to obtain the maximum production effect and at the same time assure the absence of harmful impurities in treated crops.

1/1

USSR

UDC: 621.317.77

GORSHKOV, A. I., VOYNO, L. V., GLEZER, Ya. V., MARLATOV, V. D.

"A Controllable Phase Shifter"

Moscow, Otkrytiya, izobreneniya, promyshlennyye obraztsy, tovarnyye znaki, No 12, Apr 71, Author's Certificate No 299947, Division H, filed 12 Jun 69, published 26 Mar 71, p 207

Translation: This Author's Certificate introduces a controllable phase shifter with integrating link. As a distinguishing feature of the patent, the phase shift is made independent of the change in frequency of the signal being regulated by connecting a phase switch at the output of the phase shifter, and connecting two limiters to the output of the integrating link through an amplifier with automatic gain control. These limiters are also connected to voltage sources of equal value and opposite sign. Connected to the outputs of the limiters through differentiating circuits and diodes are the opening and closing inputs of a flip-flop and an integrating link and limiter connected in series with the flip-flop.

1/1

USSR

UDC 621.791.762.5:536.2

KRIVENKO, V. G., Candidate of Technical Sciences, and DOBROVOL'SKIY, V. P.,  
GORSHKOV, A. P., and FORTUNATOVA, N. N., Engineers, Institute of Electric  
Welding imeni Ye. o. Paton, Academy of Sciences Ukrainian SSR

"Heating Type EP199 Heat-Resistant Alloys in Resistance Welding with Impulse  
Fusion"

Kiev, Avtomaticheskaya Svarka, No 2, Feb 74, pp 12-15

Abstract: The effect of the basic parameters of the impulse fusion process on heating the ends of parts prior to upsetting were studied and the values of these parameters, ensuring a minimum welding time, were determined in the welding of type EP199 heat-resistant alloys. The Hartley-Kono scheme was used in this work for selecting the controlling and output parameters. It was found that in resistance welding of heat-resistant alloys by impulse fusion with low-frequency vibrations (up to 5 Hz), the heating of parts is determined by the main control parameters and to a large degree by their interaction. The optimum values of the vibration parameters in welding EP199 alloys were vibration amplitude  $A = 1-1.3$  mm and vibration frequency  $f = 3-4$  Hz. The required temperature of not less than  $1000^{\circ}\text{C}$  at the upset zone boundary can be achieved in 90 seconds, which is 50% less in comparison with continuous preheating prior to welding. Three figures, two tables, four bibliographic references. 1/1

1/2 014 UNCLASSIFIED PROCESSING DATE--090CT70  
TITLE--KINETICS OF PROPYLENE OXIDATION ON A BISMUTHMOLYBDENUM CATALYST -U-  
AUTHOR-(04)-GORSHKOV, A.P., GAGARIN, S.G., KOLCHIN, I.K., MARGOLIS, L.YA.  
COUNTRY OF INFO--USSR 6  
SOURCE--NEFTEKHIMIYA 1970, 10(1), 59-63  
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--CHEMICAL REACTION KINETICS, PROPYLENE, CATALYTIC OXIDATION,  
FORMALDEHYDE, CHEMICAL LABELLING, CHEMICAL REACTION MECHANISM, CHEMICAL  
REACTION RATE, CARBON ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1992/1965

STEP NO--UR/0204/70/010/001/0059/0063

CIRC ACCESSION NO--AP0112929

UNCLASSIFIED



2/2 014

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0112929

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MECHANISMS OF THE OXIDN. OF H SUB2  
CO, ACH, ACRROLEIN, AND PROPYLENE WERE STUDIED BY USING PRIME14 C LABELED  
COMPOS. THE OXIDNS. WERE CARRIED OUT AT 460DEGREES ON A BI-MO  
CATALYST. RATE CONSTS. OF THE INDIVIDUAL REACTIONS ARE GIVEN.  
MECHANISMS ARE PROPOSED FOR THE OXIDN. OF PROPYLENE. FACILITY:  
INST. KHIM. FIZ., MOSCOW, USSR.

UNCLASSIFIED

UNCLASSIFIED (C) PROCESSING DATE--17JUL70  
TITLE--CHARACTERISTIC FEATURES OF CONTACT WELDING BY FUSION WELD EXECUTING  
T JOINTS -U-  
AUTHOR--CHEPEENICHOK, V.T., DOBOVELSKIY, V.P., GERSHKOV, A.P.,  
FRITZHALOV, V.A.  
COUNTRY OF INFO--USSR

SOURCE--KIEV, AVTOMATICHESKAYA SVARKA, NO 1, 1970, PP 53-56

DATE PUBLISHED-----70

SUBJECT AREAS--TECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--WELD JOINT, FUSION WELDING, WELD EVALUATION, WELDING  
INSPECTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1479/0050

STEP NO--06/0125/70/000/001/0053/0056

CITE IN REPORT--APPROX 16

Acc. Nr.: AP0046746

Ref. Code: UR0125

USSR

UDC 621.791.053.96

CHEREDNICHOK, V. T., DOBROVOL'SKIY, V. P., CORSHKOV, A. P., PRITUZHALOV,  
V. A.

"Characteristic Features of Contact Welding by Fusion when Executing T-Joints"

Kiev, Avtomaticheskaya Svarka (Automatic Welding), No 1, 1970, pp 53-56  
(from Avtomaticheskaya Svarka, No 1, 1970, p 80)

Translation: The interrelation of the parameters characterizing upsetting when executing T-joints and the quality of the welds obtained are studied. There are 7 illustrations and a 5-entry bibliography.

1/1

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Reel/Frame  
19790050



1/2 045 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--AMPLIFICATION OF SHORT SUBHARMONIC PULSES IN A PARAMETRIC AMPLIFIER  
WITH A BACKWARD WAVE -U-  
AUTHOR-(03)-GORSHKOV, A.S., MARCHENKO, V.F., SHCHIPAKIN, S.D.  
COUNTRY OF INFO--USSR  
SOURCE--VESTNIK MOSKOVSKOGO UNIV. FIZ. ASTRON. (USSR), VOL. 11, NO. 1, P.  
87-8 (1970)  
DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--HARMONIC FUNCTION, LASER R AND D, DIODE CIRCUIT, BACKWARD WAVE  
AMPLIFIER, PARAMETRIC AMPLIFIER, TRANSMISSION LINE, MODEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FAME--3008/1393

STEP NO--UR/0188/70/011/001/0087/0038

CIRC ACCESSION NO--AP0138403

UNCLASSIFIED

2/2 045

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0138403

ABSTRACT/EXTRACT--(U) GP-0-- ABSTRACT. INVESTIGATION OF THE MECHANISM OF AMPLIFICATION OF STRONG SUBHARMONIC PULSES (SUCH AS APPEAR IN LASER AMPLIFIERS IN THE REGION OF FULL SATURATION), BY MEANS OF A MODEL CONSISTING OF AN ARTIFICIAL TRANSMISSION LINE WITH A PERIODIC DISTRIBUTION OF DIODES. SOME OSCILLOGRAMS ARE ILLUSTRATED AND DISCUSSED.

UNCLASSIFIED



2/2 000  
CIRC ACCESSION NO--AP0100670

UNCLASSIFIED

PROCESSING DATE--198670

ABSTRACT/EXTRACT--RU: GP-0- ABSTRACT. ALTHOUGH MANY DEFECTOSCOPIC DEVICES HAVE BEEN SUCCESSFULLY USED FOR QUALITY CONTROL OF THIN WALLED TUBES, THEIR USE FOR THE CONTROL OF GRILLED TUBES IS IMPOSSIBLE BECAUSE OF THE INTERFERING PULSES REFLECTED FROM THE RIBS OF THE TUBE. EXPERIMENTAL STUDY OF HOW THE AMPLITUDES OF THE TRANSMITTED AND REFLECTED ULTRASONIC PULSES ARE AFFECTED BY THE RIBBED SECTION OF THE TUBE HAS SHOWN THAT A DIFFERENCE IN THE INTERFERENCE EFFECTS OF THE TRANSMITTED AND REFLECTED SIGNALS IS OBSERVED DEPENDING ON THE SHAPE OF THE RIBBING. AS A RESULT, THIS FACTOR PREDETERMINES THE CHOICE OF CONTROL METHOD. THIS PAPER DESCRIBES EXPERIMENTS OF DEFECTOSCOPIC CONTROL OF THIS TUBING TYPE USING PIEZOELECTRIC ELEMENTS MADE OF THE TST-19 CERAMIC WITH RESONANT FREQUENCIES FROM 2 TO 5.25 MHZ. IT WAS FOUND THAT DEFECTS WITH A DEPTH OF MORE THAN 25 MICRONS ON THE INNER SURFACE OF THE TUBES UNDER THE RIBBING WERE RELIABLY RECORDED; SENSITIVITY TO DEFECTS ON THE OUTER SURFACE WAS MUCH LOWER, WITH A DEPTH THRESHOLD OF 60 MICRONS. THE AUTHORS EXPRESS THEIR GRATITUDE TO P. I. VIT'KO, WHO ASSISTED IN THE EXPERIMENTS.

UNCLASSIFIED



1/3 : 028 UNCLASSIFIED  
TITLE--STRUCTURE OF TSIOLKOVSKIY CRATER -U-

PROCESSING DATE--02 OCT 70

AUTH--(04)-GORSHKOV, G.S., MELEKESTSEV, I.V., SHTEYNBERG, G.S., ERLIKH,  
E.N.  
COUNTRY OF INFO--USSR

SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR, SERIYA GEOLOGICHESKAYA, NO.  
2, 1970, PP 13-19  
DATE PUBLISHED-----70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS, SPACE TECHNOLOGY

TOPIC TAGS--LUNAR CRATER, SPACEBORNE PHOTOGRAPHY/(U)LUNAR 3 LUNAR PROBE,  
(U)TSIOLKOVSKIY LUNAR CRATER, (U)ARCHIMEDES LUNAR CRATER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FNAME--1992/1020

STEP NO--UR/0011/70/000/002/0013/0019

CIRC ACCESSION NO--AP0112171

UNCLASSIFIED

2/3 028

UNCLASSIFIED

PROCESSING DATE--02JCT70

CIRC ACCESSION NO--AP0112171

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS ARTICLE GIVES INFORMATION ON TSIOLKOVSKIY CRATER, SITUATED ON THE FAR SIDE OF THE MOON. THE STUDY WAS MADE USING PHOTOGRAPHS TAKEN IN FEBRUARY 1967 BY LUNAR ORBITER 3 (PHOTOGRAPHS FURNISHED THE AUTHORS BY THE GODDARD SPACE CENTER). THE CRATER IS ROUND, 230-250 KM IN DIAMETER, SITUATED IN AN EXTENSIVE MOUNTAINOUS REGION. THIS CRATER OR DEPRESSION IS SURROUNDED BY A RING MOUNTAIN SYSTEM 40-70 KM WIDE. A DISTINGUISHING CHARACTERISTIC OF THIS CRATER IS THE ABSENCE OF A SOLID RING WALL SUCH AS AROUND ARCHIMEDES CRATER. THE RING MOUNTAIN SYSTEM SURROUNDING THE CRATER IS SIMILAR TO THAT OF ALPHONSUS CRATER. THE DEGREE OF DESTRUCTION OF THE RING MOUNTAIN SYSTEM IS NONUNIFORM: THE SECTORS ON THE NORTH AND SOUTH ARE MOST DESTROYED. IN CONTRAST TO MOST LARGE CRATERS, THERE ARE NO CRATERLETS OF SIGNIFICANT SIZE IN THE RING MOUNTAIN SYSTEM OF TSIOLKOVSKIY. THE FLOOR OF THIS CRATER HAS A COMPLEX STRUCTURE. THE DETAILED MORPHOLOGY OF THIS FORMATION CANNOT BE EXPLAINED ON THE BASIS OF THE METEORITE HYPOTHESIS. TAKING INTO ACCOUNT THE TECTONIC NATURE OF THE RING MOUNTAIN SYSTEM SURROUNDING THE CRATER, IT CAN BE SAID THAT IT IS MUCH UNLIKE CRATERS OF THE ARCHIMEDES TYPE CHARACTERISTIC FOR "SEA" REGIONS. THE RING MOUNTAIN SYSTEM OF THE LATTER HAS AN ACCUMULATIVE NATURE AND UNDERGOES A TRANSITION INTO THE "SEA" DEPOSITS SURROUNDING THE CRATER. CRATERS OF THE TSIOLKOVSKIY TYPE ARE CUSTOMARY FOR THE "MOUNTAIN" REGIONS. THE DEPOSITS OF THE DIRECTED EXPLOSION, ASSOCIATED WITH THE DEPRESSION, INDICATE A MAJOR ROLE OF THE GAS PHASE SEPARATED AT THE TIME OF THE EXPLOSION FROM THE SILICATE COMPONENT OF MAGMA.

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UNCLASSIFIED

PROCESSING DATE--02JCT70

CIRC ACCESSION NO--AP0112171

ABSTRACT/EXTRACT--UNDER TERRESTRIAL CONDITIONS SUCH DEPOSITS ARE USUALLY ASSOCIATED WITH ACIDIC PYROCLASTIC PRODUCTS (PUMICES, IGNIMBRITES). IT CAN BE ASSUMED BY ANALOGY THAT THE DEPOSITS ASSOCIATED WITH THE EXPLOSIVE PHASE OF ACTIVITY OF TSIDLKOVSKIY CRATER AND OTHER CRATERS OF A SIMILAR TYPE HAVE A SIMILAR COMPOSITION. FACILITY: INSTITUTE OF VOLCANOLOGY SIBERIAN DEPARTMENT ACADEMY OF SCIENCES USSR.

UNCLASSIFIED

Power, Turbine, Engine, Pump

USSR

UDC: 62-235.5

MALYUTIN, P. V., GUNYAYEV, G. M., VORONISOV, I. A., FUMYANTSEV, A. P.,  
BARDINA, N. P., STEPANENKO, N. D., KARIMBAYEV, T. D., KISELEV, Yu. A.,  
GORSHKOV, L. A.

"A Turbine Blade"

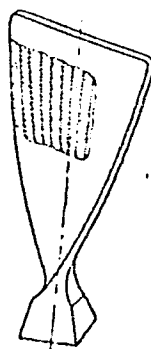
Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obrastzy, Tovarnyye Znaki,  
No 21, Jul 72, Author's Certificate No 344168, Division F, filed 31 Aug 70,  
published 7 Jul 72, p 135

Translation: This Author's Certificate introduces a turbine blade for an  
axial compressor made of a laminar composition material. As a distinguish-  
ing feature of the patent, the rigidity and vibration strength are increased  
by making the blade from alternating layers of glass and carbon fiber  
fillers oriented relative to the longitudinal axis of the blade, 34-49%  
of the fiberglass-filled layers being oriented at angles from 0 to  $\pm 15^\circ$ ,  
while 5-15% of the fiberglass-filled layers are oriented at angles from  
 $\pm 75$  to  $90^\circ$ , 20-30% of the carbon fiber-filled layers are oriented at angles  
from 0 to  $\pm 15^\circ$ , and 20-30% of the carbon fiber-filled layers are oriented  
at angles from  $\pm 45$  to  $\pm 60^\circ$ .

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USSR

MALYUTIN, P. V. et al., USSR Author's Certificate No 344168



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USSR

UDC 612.833.755-057:007.51

GORSHKOV, S. I., SHARDAKOVA, E. F., and ZHAKHMETOV, Ye. G., Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences USSR, Moscow

"Research on the Latent Time of Tendon Reflexes of Keyboard Computer Operators"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 7, 1973, pp 33-36

Abstract: Latent times of hand tendon flexion-extension reflexes and knee reflexes of 18-25-year-old female keyboard computer operators were studied as indexes of the functional state of the neuromuscular apparatus. Within 1 work day latent times of hand tendon reflexes increased significantly, more so for the left hand (flexion -- 39.3, extension -- 19 msec) than the right (flexion -- 8.5, extension -- 5.4 msec), probably because the left hand dominates in keyboard operation. Latent times of the knee reflex increased insignificantly, more so for the left leg. Latent times of all reflexes also increased during the work week, probably due to fatigue buildup. Increases were larger for the left hand (flexion -- 13.5, extension -- 1.4 msec) than the right (flexion -- 7.0, extension -- 3.0 msec) and insignificant for the knee reflex. In all cases the initial latent time was longer for left appendages. It is concluded that tendon reflexes are adequate and sensitive indexes of the state of the motor apparatus.

1/1

USSR

UDC 531.781.2

BARANOV, I. A., KOTEL'NIKOV, V. YE., GORSHKOV, V. A., and KAPTUR, G. YE.,  
Moscow Aviation Technological Institute

"A Method for Determination of Ball-Bearing Clearance"

USSR Author's Certificate No 366367, Filed 6 Jul 70, Published 16 Jan 73  
(from Otkrytiya, Izobreneniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7,  
Mar(a) 73, claim No 1460181/25-28)

Translation: A method for the determination of ballbearing clearance in the setting in the shaft and in the housing, including a determination of axial rigidity of the bearing by the frequency of resonant vibration, distinguished by the fact that in order to increase the accuracy, ball-bearing axial rigidity after the setting of an internal ring and after the setting of an external ring, the value to the clearance is determined by the difference in the values of the rigidity.

1/1

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UDC: 691.327:620.17

USSR

GORSHKOV, V. A.

"Study of the Relationship of Ultrasound Propagation Velocity to Concrete Strength by the Method of Statistical Modeling"

Moscow, Beton i Zhelezobeton, No 11, Nov 72, pp 21-23.

Abstract: The use of statistical modeling as a nondestructive method of quantitative estimation of the influence of technological parameters on the correlation between velocity and strength is quite effective and allows more complete evaluation of the essence of the ultrasonic pulse method of testing concrete strength. The relationship between velocity and strength cannot be represented as a functional relationship with the additive interference superimposed. An increase in concrete strength does not always result in an increase in ultrasound propagation velocity. The nature of the change in ultrasound propagation velocity depends on which parameter has caused the increase in strength. The basic parameters determining the relationship between velocity and strength is the variability of the compacting factor. The methodological error is not constant, but depends on the dosing errors and instability of the heat treatment mode. The sensitivity of the ultrasonic method is determined by the instability of the compacting mode and dosing errors.

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USSR

UDC 533.9.15

GORSHKOVA, L. D., GORSHKOV, V. A., and PODMOSHENSKIY, I. V.

"Determining the Radiation Power of a Plasma from Nonconducting Materials"

Minsk, Zhurnal Prikladnoy Spektroskopii, Vol. 12, No. 1, Jan 1970, pp 8-12

Abstract: The basic difficulty in the way of obtaining quantitative data concerning the radiation of a low-temperature plasma from nonconducting materials is getting a plasma with a controlled chemical composition, pressure, and temperature. A more promising plasma source is a powerful discharge pressed against a dielectric wall by a magnetic field specially developed for this purpose. The paper discusses this better method of producing a plasma, known as the H-pressed discharge method. It begins with an examination of the correspondence between the atomic chemical state of the plasma and the vaporized nonconducting material against which the discharge is pressed. Under the condition of the H-pressed discharge method the plasma is characterized by a quasi-stationary, stable radiation; temperature uniformity along the discharge axis; and known values of temperature

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USSR

GORSHKOVA, L. D., et al, Zhurnal Prikladnoy Spektroskopii, Vol. 12, No. 1, Jan 1970, pp 8-12

and pressure. Hence, the use of such a source for the study and measurement of the radiative power from a plasma of various materials is the most promising. The authors describe measurements they made of the radiating capability of such plasmas; their method was the ballistic method, in which a vacuum inertial thermocouple combined with a mirror galvanometer or a photoelectric amplifier is used as the radiation energy sensor.

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1/2 033 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--DETERMINATION OF THE RADIATIVE CAPACITY OF A PLASMA OBTAINED FROM  
NONCONDUCTING MATERIALS -U-  
AUTHOR-(03)-GURSHKOVA, L.D., GURSHKOV, V.A., PODMOSHENSKIY, L.V.  
COUNTRY OF INFO--USSR  
SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, JAN. 1970, P. 8-12  
DATE PUBLISHED---JAN70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--DIELECTRIC MATERIAL, ELECTRIC DISCHARGE, DISCHARGE PLASMA,  
PLASMA RADIATION, PLASMA MEASUREMENT, OPTIC BRIGHTNESS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1978/1215 STEP NO--UR/0368/70/012/000/0008/0012  
CIRC ACCESSION NO--AP0046139  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0046138

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. DESCRIPTION OF A TECHNIQUE FOR THE PRODUCTION OF PLASMAS FROM ORGANIC GLASS, POLYETHYLENE, QUARTZ AND OTHER NONCONDUCTING MATERIALS BY USING PULSED DISCHARGES IN THE PRESENCE OF A MAGNETIC FIELD. STEADY AND HOMOGENEOUS RADIATION WAS OBTAINED ALONG THE DISCHARGE AXIS WHEN THE DURATION OF THE PULSE WAS ROUGHLY 1 MU SEC. IT IS ALSO FOUND THAT THE ATOMIC COMPOSITION OF THE FLAME CORRESPONDS TO THE CHEMICAL COMPOSITION OF THE MATERIAL USED. A BALLISTIC TECHNIQUE AND A VACUUM THERMOCOUPLE WERE USED IN MEASURING THE INTEGRAL PLASMA BRIGHTNESS IN THE 200 TO 2000 NM RANGE. NUMERICAL VALUES OF PLASMA BRIGHTNESS AT TEMPERATURES FROM 12,000 TO 16,000 DEG K ARE GIVEN FOR A GROUP OF NONCONDUCTING MATERIALS.

UNCLASSIFIED

USSR

UDC 615.849.1.015.25.015.4

KULAGIN, A. N., KOZLOV, V. A., and GORSHKOV, V. I., Scientific Research Laboratory of Experimental Immunobiology, Academy of Medical Sciences USSR, Moscow

"Changes in the Radiosensitivity of CAVE Line Cells Following Multiple Action of beta-Mercaptopropylamine"

Moscow, Byulleten' Eksperimental' noy Biologii i Meditsiny, Vol 72, No 9, Sep 71, pp 53-56

Abstract: A variant of cells resistant to high concentrations of radioprotectors was obtained and their radiation resistance studied. CAVE line cells (obtained in 1961 from the epithelium of stomach cancer in woman) were used because of least adhesiveness and slower fragmentation after destruction. The radioprotector selected was beta-mercaptopyrrolamine (MPA) the most effective of the aminothiols compounds used in the prophylaxis of radiation damage. The cells were subjected to constant contact with the MPA preparation, multiplied, and were again processed with the preparation, a total of ten times. After multiple processing the cells differed from the original line and were designated as CAVE<sub>k-10<sub>v</sub></sub>. Compared to the CAVE line, they con-

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USSR

KULAGIN, A. N., et al., Byulleten' Eksperimental'noy Biologii i Meditsiny,  
Vol 72, N1 9, Sep 71, pp 53-56

tained a greater number of cells resistant to high concentrations of MPA and lesser sensitivity to ionizing radiation. These indexes were maintained during two years of cultivation of the cells under routine conditions. This suggests a possible use of pharmacochemical protection for increasing the resistance of body tissues to the effect of radiation.

2/2

- 31 -

Ion Exchange

USSR

UDC 621.039.325

BAYRAKOV, V. T., SUFANOV, M. S., and GORSHKOV, V. I., Moscow State University  
imeni M. V. Lomonosov

"Separation of Isotopes During Exchange Between Molecules of the Gas Phase and  
Ions of a Solid-Exchanger. III. Determination of H.E.T.C. During Exchange  
Between Ammonium and the Ammonium Form of an Ionite in a Counterflow Column"

Moscow, Zhurnal Fizicheskoy Khimii, Vol XLV, No 11, Nov 71, pp 2909-2911

Abstract: Counter flow of ammonium and a cationite was induced in a 2-meter-high  
column 25 mm in diameter (KU-2 X 9 cationite). The H.E.T.C. (height equivalent  
of a theoretical column) was calculated both on the basis of the time dependence  
of the enrichment factor and on the basis of the distribution of isotopes along  
the column once the stationary state had been reached. Variation in the enrich-  
ment factor, data for the calculation of the H.E.T.C., and design of the column,  
are illustrated graphically and with a table.

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Acc. Nr.: AP0042563

Ref. Code: UR0362

JPRS 5-162

Measurement of Turbulent Moisture Fluxes with IR Hygrometer

(Abstract: "Measurements of Turbulent Moisture Fluxes with an Infrared Hygrometer," by L. G. Yelagina, V. I. Gorshkov and E. T. Mironenko, Institute of Physics of the Atmosphere; Moscow, Izvestiya Akademii Nauk SSSR, Fizika Atmosfery i Okeana, Vol VI, No 1, 1970, pp 92-95)

During the summer of 1968 the State Hydrological Institute made systematic measurements of moisture fluxes with an infrared hygrometer at the Valday Scientific Research Hydrological Laboratory for comparing the results with data obtained using the large-model hydraulic evaporator. The latter instrument is a precise apparatus for measuring evaporation from the earth's surface by constant weighing. The instrument's surface area is 5 m<sup>2</sup> and it holds a monolith of earth weighing 40 tons; weighing accuracy is 5 grams. The spectroscopic method, based on water-vapor absorption of radiation in the IR region, has advantages in comparison with other methods for measuring humidity; in particular, it is direct, inertialess and suitable for determining humidity at below-zero temperatures. On the other hand, it is difficult to use because the transmission function of water vapor in the working region of the spectrum must be measured with

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a great accuracy and it cannot be used in measuring relative humidities close to saturation. The results given in this paper were obtained using the water vapor absorption band at  $1.9 \mu$ . Detailed results obtained under specific circumstances are given. The distance between the compared instruments, the IR hygrometer and the large-model hydraulic evaporator, was 1.5 km. It was found that the mean daily values of the moisture flux as registered by the two instruments were quite close.

19760540

USSR

UDC 535.37

GORSHKOV, V. K.

"Energy Transfer Between Donor and Acceptor Molecules in Liquid and Solid Solutions as a Function of the Nature of the Surroundings and Temperature"

V sb. Peredacha energii v kondensirovan. sredakh (Energy Transfer in Condensed Media -- Collection of Works), Yerevan, 1970, pp 139-148 (from RZh-Fizika, No 7, Jul 71, Abstract No 7D759)

Translation: The dependence of energy transfer under different relative donor and acceptor concentrations but for the same total number of molecules per unit volume for each pair was investigated. The donors were 9,10-dibromanthracene, 3-aminophthalimide, and n-aminophthalimide. The acceptors were rhodamine S, rhodamine 6Zh, safranine, etioporphyrin, and protoporphyrin. It was established that the transfer coefficient rises with an increase in the relative acceptor concentration. The effect of temperature on energy transfer was investigated for anthracene + naphthacene pairs in naphthalene. It was shown that at helium temperatures the transfer coefficient is less than at room temperature (30 and 68%). The results are discussed. 12 ref. T. S.

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1/2 026 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--ENERGY TRANSFER BETWEEN MOLECULES OF VARIOUS IMPURITIES IN A  
NAPHTHALENE LATTICE -U-  
AUTHOR--(02)-ZHEVANDROV, N.D., GORSHKOV, V.K.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF TEMP. ON THE SINGLET STATE EXCITATION ENERGY TRANSFER BETWEEN DONOR ACCEPTOR PAIR IMPURITIES IN NAPHTHALENE POLY CRYSTALS WAS STUDIED. ANTHRACENE NAPHTHACENE AND ANTRACENE LUMCGEN A (1:1 MOLAR RATIO) WERE USED AS THE DONOR ACCEPTOR PAIRS AT THE ABS. CONCNS. 10 PRIMES NEGATIVE, 10 PRIMES NEGATIVE G-G MATRIX. THE CHANGES OF ENERGY TRANSFER FROM THE DONOR TO THE ACCEPTOR AT 290DEGREESK AND 60DEGREESK WERE DETD. BY COMPARING THE INTEGRAL INTENSITY OF LUMINESCENCE OF THE DONOR AND ACCEPTOR INCORPORATED IN AN ADMIXT. INTO THE MATRIX AND EXCITED BY THE LIGHT ABSORBED ONLY BY THE DONOR WITH THE LUMINESCENCE INTENSITY OF BOTH DONOR AND ACCEPTOR INCORPORATED SEP. INTO THE MATRIX AND EXCITED BY THE LIGHT OF APPROPRIATE WAVELENGTH (365 NM FOR THE DONOR AND 436 NM FOR THE ACCEPTORS). WITH DECREASING TEMP., A CONSIDERABLE DECREASE OF THE ENERGY TRANSFER OCCURRED. THE COEFFS. OF THE ENERGY TRANSFER AT 60DEGREESK AND 290DEGREESK WERE CALCD. FOR THE ANTHRACENE NAPHTHACENE PAIR ( $K_{PRIME60DEGREES} 0.30$ ,  $K_{PRIME290DEGREES} 0.63$ ), AND FOR THE ANTHRACENE LUMCGEN A PAIR ( $K_{PRIME60DEGREES} 0.45$   $K_{PRIME290DEGREES} 0.72$ ). THE TEMP DEPENDENCE OF THE ENERGY TRANSFER BETWEEN THE IMPURITY MOLES. WAS CONTROLLED BY THE INTERACTION OF ELECTRON EXCITATION WITH THE LATTICE VIBRATIONS. NO CHANGE OF THE ENERGY TRANSFER WITH TEMP. WAS OBSD. WHEN THE MEASUREMENTS OF THE SAME DONOR ACCEPTOR PAIRS WERE MADE IN POLYSTYRENE FILM INSTEAD OF NAPHTHALENE, I.E. IN THE ABSENCE OF CRYSTAL STRUCTURE. FACILITY: FIZ. INST. IM. LEBEDEVA, MOSCOW, USSR.

UNCLASSIFIED

GORSHKOV, V. P.

PHYSIOLOGICAL AND BIOCHEMICAL REGULATION OF ADAPTATION OF HUMAN BEINGS TO SPACE FLIGHT

(Article by V. V. Gorbunov, L. S. Solov'yev, V. A. Zolotarev, A. A. Shchegolev, and V. V. Gorbunov, Institute of Space Biology and Medicine, Russian Academy of Sciences, Moscow, U.S.S.R.)

The composition of the sessions (L-210, L-211 and L-212) elixirs (E-320, E-321) was tested in the isolation chamber experiments lasting 22 and 30 days in which the adaptation of microclimate were carefully controlled.

In the first experiment there were three groups of subjects, two in each group. Over a 10-day period the first group used L-210 lotion for care of the skin and the hairy part of the head; elixir E-320 was used for care of the oral cavity. Over a 20-day period the second group used L-211 lotion and E-321 elixir, whereas the third group underwent all specified procedures without lotion.

In the second experiment, during the first 17 days two subjects used L-210 lotion and L-211 elixir, on the next three days -- lotion E-320 and during the concluding 10-day period -- L-211 lotion and E-321 elixir.

Shaving was with a safety razor and "propaganda" shaving cream of the "Flora" and "Voskres" types.

The schedule for using these means of personal hygiene was drawn up taking into account the physiological characteristics for space flights with a duration from one to three months. The mean daily expenditure by one subject was 75 g of lotion, 7 g of elixir, and 10 g of shaving cream.

Over a five-month period we checked the possibility of long-term storage of L-211 lotion and E-321 elixir in room

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UDC 621.376.326.

GORSHKOV, YE. S., KLYAGIN, L. YE., Active Members of the Scientific and Technical Society of Radio Engineering, Electronics and Communications imeni A. S. Popov

"A Single-Band Resistance-Capacitance Frequency Converter"

Moscow, Radiotekhnika, Vol 26, No 6, Jun 71, pp 55-61

Abstract: A device without inductances or transformers is proposed for shaping a single-band signal. Micromodular construction gives a device with considerably lower cost and overall dimensions than similar devices with inductances and transformers with the same qualitative indices. Side-band suppression is at least 36 dB for a modulating frequency band of 300-3400 Hz, and carrier frequency suppression is at least 40 dB. Frequency suppression is by the phase-difference method. The device consists of low- and high-frequency phase shifters and a single-band frequency multiplier. A method is given for calculating the parameters of the converter and selecting circuit elements. The resultant formulas are confirmed by experimental data.

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UDC: 621.376.2

KLYAGIN, L. Ye., CORSHKOV, Ye. S.

"A Wide-Band RC Phase Shifter"

Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR (Works of Academic Institutes of Communications. Ministry of Communications of the USSR), 1970, vyp. 51, pp 71-78 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D310)

Translation: A procedure is given for calculating a wide-band phase shifter with a minimum number of elements to be used for devices for shaping a single-band signal by the phase difference method. Two voltages which are equal in amplitude with a predetermined phase difference are produced at the output of the phase shifter. The proposed phase shifter differs from conventional units in the increased width of the frequency band and a lower phase difference error. Resumé.

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Acc. Nr.: AP0042642Ref. Code: UR0203

JPRS 50/62

Riometer Absorption and Ionospheric-Magnetic Activity

(Abstract: "Study of the Correlation Between Riometer Absorption and Ionospheric-Magnetic Activity in the Auroral Zone," by Yu. N. Gorshkov and N. M. Denisenko, Northeastern Multidiscipline Scientific Research Institute, Siberian Department Academy of Sciences USSR; Moscow, Geomag- netizm i Aeronomiya, Vol X, No 1, 1970, pp 73-76)

In order to explain the nature of anomalous absorption in the high latitudes it is very important to determine the quantitative characteristics of its interrelationship with variations of ionospheric and geomagnetic parameters. This paper examines the correlations of these phenomena on the basis of data from vertical sounding of the ionosphere and riometer absorption at Cape Shmidt and geomagnetic observations in the world net during 1966. Cosmic radio emission was registered at a frequency of 32 Mc/sec. As a characteristic of ionospheric disturbance the authors computed the hourly deviations of the critical frequencies of the F2 layer and the minimum frequency of reflection from the corresponding median values for ten magnetically quiet days. The collected data were used in determining the diurnal variations of these deviations for disturbed days for summer and winter. In addition, the mean daily  $\Delta f_0 F2$  and  $\Delta f_{min}$  values

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were computed; these can be used as a quantitative characteristic of change in the state of ionization of the upper atmosphere with time. Geomagnetic disturbance was estimated from the  $\sum K_p$  indices. Disturbed days were those with  $\sum K_p > 15$ . The seasonal variation of the mean daily A (absorption) values, computed separately for magnetically quiet and disturbed days, agree rather well with the similar variation of the  $\sum K_p$  index. The curves show that in both cases the A and  $\sum K_p$  maxima coincide and fall in September, whereas the A minimum, falling in April, relates to a period of relatively low geomagnetic activity. For disturbed days the correspondence between A and  $\sum K_p$  is considerably better than for quiet days. There is a relatively good correspondence in changes of A and  $\Delta f_{min}$ . Correlation coefficients are almost not dependent on season and for winter and summer are 0.67 and 0.63 respectively. As a characteristic of absorption one can use  $f_{min}$ ; the reliability of the estimates will be approximately identical for any season. There is no correlation between absorption and  $\Delta f_0 F_2$  in winter; the correlation is not much better in summer. The results indicate a small contribution of the F2 layer to total absorption (which contradicts some other studies). On disturbed days the absorption maximum is at 1130 LT, with the minimum at midnight. There is also a morning maximum at 0600. The distribution of maximum and minimum values in

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summer is different. The minimum and morning maximum are two hours later than in winter and there is no nighttime maximum. In general, increased absorption in winter occurs during the first half of the day and in the summer in the second half; this is governed by the seasonal difference in the distribution of geomagnetic activity. Correlation of other parameters is analyzed. The correlation between total absorption and the  $K_p$  index is high; it is linear and expressed by the regression equation.

$$A = 0.3 + 0.036 \sum K_p.$$

Using this equation, on the basis of data on the level of geomagnetic activity it is possible to judge with a good degree of approximation the degree of absorption for a particular region and vice versa, using mean absorption for a particular day it is possible to determine the magnetic disturbance.

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UDC: 669.017:539.37

KOLACHEV, B. A., GORSHKOV, YU. V., MAL'KOV, A. V., SEDOV, V. I., and DROZDOV, P. D.,  
Moscow

"The Effect of Hydrogen on the Breakdown Strength of the OT4 and OT4-1 Grades of Alloys"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 73, pp 102-107

Abstract: The authors study the effect of hydrogen on the critical coefficient of the intensity of stresses on the OT4 and OT4-1 titanium alloys during the testing of specimens with fatigue cracks for static console bending. This type of testing shows the susceptibility of sheet titanium materials to brittle fracture. The results show that the breakdown strength for the OT4 and OT4-1 alloys is somewhat increased at a hydrogen concentration in the order of 0.008-0.012 percent and then falls. The magnitude of the coefficient of stress intensity is not a constant of the material, but depends on a series of factors including hydrogen content in the alloy and the work time under load. The micro-breakdown mechanism changes as hydrogen content rises. Micro-cracks appear in the specimen during the formation and interaction of twins in the plastic deformation process up to a hydrogen content in the order of 0.01 percent for OT4-1 and 0.012 percent for OT4. Further increase in hydrogen concentration results in the realization of a new mechanism: splitting of the beta phases

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KOLACHEV, V. A., et al, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 73, pp 102-107

and the formation of micro-cracks on the alpha-beta phase boundary division. The mechanism takes effect at hydrogen concentrations greater than 0.015 percent. The micro-breakdown mechanism affects the basic stages of micro-crack growth which ultimately is reflected in the ductility of the material.

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